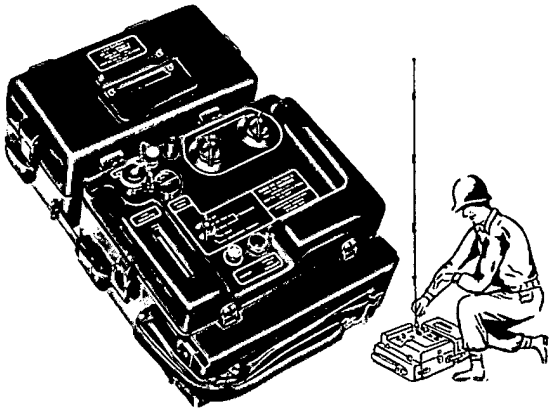
**MOTOROLA**

# TECHNICAL DATA SHEET



## RADIO SET–BEACON
## AN/GRN-8

The AN/GRN-8 — a ground radio navigational beacon — is intended to mark landing and supply drop zones, provide en route navigational assistance to aircraft, and afford two-way voice communication on a ground-to-air or ground-to-ground basis.

### FEATURES

- FREQUENCY RANGE . . . . . 30.00 to 39.95 mc
- CHANNELS . . . . . 200 spaced every 50 kc
- POWER OUTPUT . . . . . 5 watts
- MODULATION . . . . . FM
- MODES . . . . . transpond, continuous transmit and voice
- SIZE and WEIGHT . . . . . occupies less than one-half cubic foot; weighs only 30 pounds

ADDRESS INQUIRIES TO:
**MOTOROLA**
***Chicago Military Electronics Center***
1450 NORTH CICERO AVENUE, CHICAGO 51, ILLINOIS
ATTN: *Program Planning*

The AN/GRN-8, developed by Motorola for the Signal Corps under Contract DA-36-039-SC-78060, is self-contained, portable and automatic. It is frequency modulated, and uses a conventional double-conversion receiver, 5-watt transmitter, a clip-on 24-volt battery pack and a collapsible 6-foot whip antenna. The set is designed for use in all environments and ruggedized throughout for air drop either with a parachutist or equipment parachute.

In its tactical application, the set operates with existing airborne radio sets, such as the AN/ARC-44 and -54; homing devices, such as the AN/ARA-31; and ground pack sets, such as the AN/PRC-10.

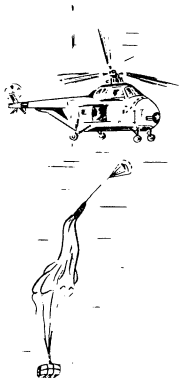
When used as a navigational beacon, this set provides for 4000 unique responses which are combinations of channel frequencies (200), Morse Code letters (10) and selective calling tones (2). This is significant when marking air corridors where positive identification of a particular beacon is imperative.

Two distinctive physical characteristics of this set are its compactness and light weight. Compactness is achieved through the extensive use of transistors and modularized design — 17 plug-in modules in all. Cases, brackets and supporting elements are constructed of aluminum, plastics or other lightweight alloys with no sacrifice in rigidity nor performance.

The radio set is simple to operate, having only three operator controls. Four operating modes and 200 discrete channel frequencies are selectable from the front panel. Frequency selection merely requires positioning the 20-point KC and/or 10-point MC selector. From the front panel, the operator can read the code letter and tone in use, plus a red-line meter indication of transmitter power output.

Four operating modes afford radio set flexibility.

- ✦ TRANSPOND (NO TONE) . . . receiver listens for FM homing signal (unmodulated or tone modulated carrier) and upon receipt keys transmitter for 35 seconds. Transmitter responds with a Morse Code letter, sent three times in five seconds, followed by a 150- or 170-cps tone for 30 seconds.
- ✦ TRANSPOND (TONE) . . . same as above, except receiver accepts only selective calling tone (either 150 or 170 cps depending upon internal TONE SELECT setting).
- ✦ CONTINUOUS TRANSMIT . . . repetitive transmit, 5 seconds of code and 30 seconds of tone.
- ✦ VOICE . . . AN/GRN-8 functions as a conventional FM two-way radio.



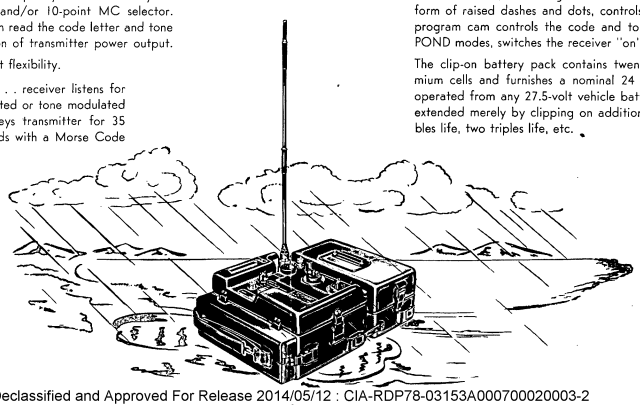
The TRANSPOND modes provide beacon security—transmission only when interrogated. The TRANSPOND (TONE) mode affords maximum security.

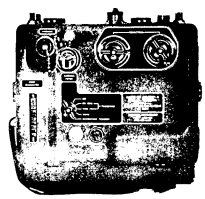
The AN/GRN-8 receiver delivers two outputs; audio to the handset receptacle (VOICE mode) and a key signal to a transmit-receive relay (TRANSPOND modes). Handset H-138 (not supplied) is used for voice operation.

Keying of the transmitter 1) disables receiver, 2) powers transmitter and 3) activates code mechanism. The code mechanism, consisting of a drive motor, program cam and nylon code drum, controls the response of the transmitter.

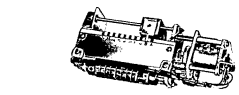
The code drum, containing 10 bands of imprinted code letters in the form of raised dashes and dots, controls a 2500 cps oscillator. The program cam controls the code and tone intervals and in TRANSPOND modes, switches the receiver "on" at the end of the response.

The clip-on battery pack contains twenty-five 1.25-volt nickel cadmium cells and furnishes a nominal 24 volts. The set can also be operated from any 27.5-volt vehicle battery. Operating life can be extended merely by clipping on additional battery packs—one doubles life, two triples life, etc.

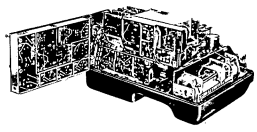




*Front Panel*



*Code Mechanism*



*Interior*

## CHARACTERISTICS • • •

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|---|---|
| SIZE | 15½" x 10" x 5⅝ (includes battery pack) |
| WEIGHT | 30 lbs |
| ENVIRONMENTAL TESTS | Shock: six impact shocks of 50 G's for 11 milliseconds each |
| | Vibration: 0.01 inch over range of 5 to 500 cps |
| | Temperature: Operating —40°C to +65°C<br>Non-operating —55°C to +70°C |
| | Altitude: Operating 20,000 feet<br>Non-operating 50,000 feet |
| | Humidity: five 48-hour cycles per MIL-STD-170 |
| | Immersion: 2 hours in 3 feet of water |
| BATTERY LIFE | 48 hours 10:1 receive-transmit duty cycle<br>4 hours continuous transmit |
| CURRENT DRAIN | Receive: 35 ma<br>Transmit: 1.6 amperes |
| CHANNELS | 200 in 30.00 to 39.95 mc band |
| POWER OUTPUT | 5 watts |
| BANDWIDTH | 30 kc |
| FM DEVIATION | Tone: ±2.5 kc<br>Voice and code: ±10 kc |
| STABILITY | 0.012% (—40°C to +65°C) |
| SPURIOUS RESPONSES | —80 db |
| SENSITIVITY | 2.5 uv |
| AUDIO OUTPUT | 1 mw |
| CODE LETTERS | A, B, C, F, H, J, K, L, M and N |
| ACTIVE ELEMENTS | 25 transistors, 3 tubes |
| CRYSTALS | 30 |

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